For many of us, indoor air quality is not a topic that claims our attention until we experience an issue, such as an allergy or asthma that causes us to become aware of the air we breathe. This issue of Health and Safety News seeks to provide information for individuals related to the topic of air quality. The Homeowners Insurance.org-Tips and Guides for Homeowners website (http://www.homeownersinsurance.org/) provides very useful information on this important subject. The site addresses radon, mold, asbestos, carbon monoxide, secondhand smoke, Legionnaires’ disease, and fine particles.

**Definition:** Legionnaires' disease is a type of pneumonia caused by bacteria. You usually get it by breathing in mist from water that contains the bacteria. The mist may come from hot tubs, showers or air-conditioning units for large buildings. The bacteria don't spread from person to person (MedLine Plus http://www.nlm.nih.gov/medlineplus/legionnairesdisease.html and Centers for Disease Control and Prevention http://www.cdc.gov/legionella/index.html, 2011).

**Note:** To read more about topics highlighted in blue, right click on the mouse and select Open Hyperlink.
Indoor Air Quality Resource Guide

The quality of the air we breathe is an important aspect of overall wellbeing and people should do all that they can to prevent air pollution and avoid unhealthy settings. Air pollution is not only an exterior problem, but also an interior one as well. In fact, it may be even more important to maintain excellent indoor air quality than it is to address outdoor air quality because trapped indoor air has a more long-lasting impact on a person’s health than air that freely circulates outdoors. It is important to be well informed on indoor air quality, so as to recognize and address indoor air pollution as soon as possible and prevent disastrous side effects. The following lists the major causes of poor indoor air quality, the harmful effects of these substances, and what can be done about them.

Radon

Radon is an elemental gas that is found naturally as part of a variety of isotopes. It is produced when the radioactive element radium decays, and it is both colorless and odorless. Radium is found throughout the earth’s crust in varying degrees of concentration, which means that there is radium present in nearly all soil on earth. Radon is thus present in different levels throughout many homes in the United States at an average rate of 1.3 picocuries per liter of indoor air.

The major health impact of radon exposure is the increased risk of lung cancer that comes with it. Even those who have never smoked greatly have increased odds of developing lung cancer if they are exposed to extremely high levels of radon. The U. S. EPA estimates that 260 out of 1,000 residents of homes with a radon level of 20 picocuries per liter will develop lung cancer as a result of exposure.

Because it is colorless and odorless, radon can only be detected through a special test performed either by a contractor or by the homeowner with a radon detection kit. Once discovered, a variety of techniques can be performed to lower radon levels. Sealing cracks in basement walls and foundations can prevent radon from entering the structure, but most experts recommend going beyond this to installing an air extraction system that uses a fan and one or more pipes to ventilate air from the underlying soil into the surrounding
environment and not the home. A high-density plastic sheet placed on the earthen floor of a home’s crawl space combined with this extraction system can also be effective.

Mold

Molds are naturally occurring fungi that help to break down biological matter and other substances. Like other fungi, they originate from spores that land in hospitable places and start growing because they can feed on whatever they have landed upon.

Moisture is a key need of molds, so they can be found wherever moisture levels are high and consistently present. Thus, basements and bathrooms are common places where mold might be found indoors. Places where water is leaking such as cracks in a roof or pipes are also common locations to find mold, and homes in hot, humid climates are especially susceptible to mold growth.

Due to its being a strong allergen, mold can spark a variety of allergic reactions in people such as watery eyes, sneezing, and more. It is particularly dangerous to asthmatics and persons with compromised immune systems, leading to asthmatic attacks or fungal infections. Certain molds produce toxins that have been linked to liver damage and lung cancer.

The key to getting rid of mold permanently is getting rid of excessive moisture in a home. This will involve fixing any known leaks and/or ensuring that ventilation of wet areas like bathrooms is adequate to allow such rooms to dry out properly. Cleaning up mold without addressing the moisture issues means that it will come back. Mold can be scrubbed off hard surfaces and killed with bleach, but if it has been growing on a porous material, that material will likely need to be replaced. Professionals should be called in to remove mold when the problem is extensive or if the moisture source is a sewage leak of some kind.
Asbestos

Asbestos is a fibrous mineral that has been used for many years in a wide variety of commercial and industrial applications. It is currently banned in new construction in the United States. Individuals are most likely to find asbestos in older homes and offices, usually in insulation. Floor tiling, acoustical enhancements, and fireproofing materials in older buildings are also sources of asbestos fibers. When these materials are disturbed, damaged, or start to deteriorate, asbestos fibers are released into the air.

Like other indoor air pollutants, asbestos is most damaging to the lungs of those who inhale it. As the number of asbestos fibers inhaled increases, the risk of lung cancer, mesothelioma (a cancer that affects the lining of a person’s chest cavity), and asbestosis (scarring of the lungs with fibrous tissue) also increases.

If asbestos is undisturbed and likely to remain that way, it is all but certain that nothing will need to be done about it. Otherwise, professionals will have to be called in to treat the problem. This will be done either through the removal of the asbestos-containing material or through enclosing the asbestos using a chemical or physical structure that will prevent its fibers from becoming airborne.

Carbon Monoxide

A toxic, odorless, and colorless gas, carbon monoxide is particularly dangerous; as it may lead to death long before anyone knows it is present. It is related to carbon dioxide and has the same chemical composition except that a molecule of carbon monoxide has one atom of oxygen as opposed to the two atoms of oxygen contained in a molecule of carbon dioxide.

Carbon monoxide is found in automobile exhaust, unvented gas space heaters, leaking chimneys, and similar sources. Buildings with attached garages or poorly maintained furnaces are at a particularly high risk of having high indoor concentrations of carbon monoxide.
When high levels of carbon monoxide are inhaled, the human body is inhibited from using oxygen, leading to death if the exposure continues. At lower levels, fatigue, dizziness, impaired vision, and other problems are likely to result from carbon monoxide exposure.

Carbon monoxide can be removed or kept at safe levels as long as there is adequate ventilation and the right fuel is used for heaters and furnaces. Opening the flue when a chimney is in use, refusing to idle the car in the garage, and venting heaters properly are all key in solving a carbon monoxide problem.

**Secondhand Smoke**

Secondhand smoke is the smoke that smokers produce but that those who are not smoking inhale. Recent years have seen an explosion of knowledge about the dangers of secondhand smoke on non-smokers. If there is a smoker nearby, then there will be secondhand smoke. Thus, environments such as bars and nightclubs are places where this smoke will be commonly found, as are the homes where smokers live. Drivers who smoke also release secondhand smoke into their cars when they drive.

The health of children is particularly affected by secondhand smoke, and kids who are exposed to it suffer an increased risk of asthmatic attacks, respiratory problems, and more. Odds of getting lung cancer are also much greater for those who are exposed to secondhand smoke, and some studies have shown that those who inhale secondhand smoke may have a higher risk of developing lung cancer than those who are actually doing the smoking.

Setting up smoke-free environments is the best way to get rid of secondhand smoke. Smokers can pledge not to smoke inside the home or in the car, and smokers are now forbidden to smoke in most indoor areas in the United States today. Fans and ventilation can also help, but the best method is to forbid smoking in indoor areas.

**Note:** In order to further protect children riding in automobiles, Arkansas lawmakers amended the
Arkansas Protection from Secondhand Smoke for Children Act of 2006. For further information on the new law that went into effect July 27, 2011, see the following address:


Legionnaires’ Disease

Legionnaires’ disease is an infection of the lungs that is caused by the inhalation of Legionella bacteria. It afflicts tens of thousands of people in America each year, particularly middle-aged and elderly citizens. Legionella bacteria live in water and so may be present wherever water is found. High-moisture, poorly ventilated areas are places where the concentration of Legionella may be especially high, so those exposed to fountains, whirlpool spas, humidifiers, cooling towers, and more are at a high risk of contracting the bacteria. Since it grows in warm water, the odds that a water sample contains said bacteria go up as the temperature of a body of water increases.

Pneumonia is a common effect of Legionnaires’ disease, and the form of pneumonia that results can be particularly difficult to eradicate. Prescribing the right antibiotic at the right time is crucial to getting rid of the infection. Smokers and others who have compromised respiratory systems are at a great risk for contracting Legionnaires’ disease.

As noted, Legionnaires’ disease is treatable with the proper kind of antibiotics. Otherwise, the growth of Legionella bacteria can be inhibited through treating potential water sources with chlorine and other antibacterial agents and chemicals. Preventing Legionella bacteria from taking root in a water source will prevent Legionnaires’ disease from occurring.

Fine Particles

Fine particles are extremely small bits of liquid and solid materials that are suspended in the air. Typically, fine particles will be a mixture of inorganic and organic substances, and they can cause irritation when they are inhaled.
Exhaust from cars, cigarettes, factories, and other sources is one of the major sources of fine particles. Chemicals and other solid substances may release fine particles into the air when they are combusted. These particles are a problem for indoor air when such activities are carried out inside or when it is easy for outdoor smoke and other pollutants to get into a home or other kind of building.

Depending on the size and composition of the fine particles and the length of exposure to them, the effect on human health can be tremendous. They can trigger asthmatic attacks, irritate eyes, noses, and throats, lead to chest pain, and other issues. Like other indoor air pollutants, smokers and others with respiratory problems will suffer the most from exposure to fine particulate matter in the air around them.

Fine particles can remain suspended in the air for a long time, so it is best to minimize outdoor exposure to them when there is a great deal of smoke in the local atmosphere. Having a properly sealed home, minimizing exposure to high traffic areas, and staying informed about air pollution alerts are all key to avoiding particulate matter in the air.

Conclusion

Indoor air pollution is a problem, but it can be solved when people follow the aforementioned, commonsense tips. Taking a few extra precautions, testing the air, and opting for immediate removal of pollutants will all lower the risk of respiratory disease and make it more likely that people will live long and healthy lives. Breathing in clean air will lead to long-term health.

For more information on indoor air quality and safety precautions, please visit the following resources:

- EPA's Guide to Indoor Air Quality
- Safety and Health Topics: Indoor Air Quality
- Indoor Air Quality Association
- Indoor Air Pollution
- Guide to Indoor Air Quality
- Mold and Indoor Air Quality
- Asbestos Awareness
- About Radon
- Carbon Monoxide Information
- Legionella
Indoor Air Quality Publications and Statistics

Indoor Air Quality Self-Inspection Checklist